Amended Claims

1. Method for determining the number of receptors on a carrier, with the method comprising the steps:

(a) Preparation of a carrier;

(b) immobilization of at least one receptor on the carrier, with the receptor having the ability to interact with a ligand and to form a receptor-ligand complex;

(c) after immobilization of at the at least one receptor on the carrier: bringing a marker in contact with the receptor, in order to form a receptor-marker complex with separable binding between receptor and marker;

(d) determining the number of receptors on the carrier by detecting the receptor-marker complexes;

with the receptor-marker complexes being detected independently of receptor-ligand complexes.

2. Method according to Claim 1, characterized by the fact that step (i) is performed additionally after step b) or c) or d):

(i) bringing the receptor in contact with a test sample that is to be examined for its content of ligands.

3. Method according to Claim 2, characterized by the fact that step (ii) is performed additionally after step (i):

(ii) detection of the receptor-ligand complexes.

4. Method according to one of the foregoing claims, characterized by the fact that the carrier is a semiconductor with a surface of silicon, semimetal oxides, especially SiO_x, or aluminum oxide.

5. Method according to one of the foregoing claims, characterized by the fact that the receptor is selected from the group consisting of antibodies, especially monoclonal or polyclonal antibodies, and functional fragments thereof; proteins, oligo- and polypeptides, nucleic acids, especially DNA, RNA, cDNA, PNA, oligo- and polynucleotides; as well as saccharides, especially mono-, di-, tri-, oligo-, and polysaccharides.

6. Method according to one of the foregoing claims, characterized by the fact that the binding between receptor and ligand in the receptor-ligand complex is separable.

7. Method according to one of the foregoing claims, characterized by the fact that the binding between receptor and ligand has a half-life in the range of microseconds (= μs) or longer.

8. Method according to one of the foregoing claims, characterized by the fact that n markers or a multiple of n markers are associated with n receptors.

9. Method according to one of the foregoing claims, characterized by the fact that the marker has reactive groups, especially thiol groups.

10. Method according to one of the foregoing claims, characterized by the fact that the marker is a dye, in particular a luminescent dye, especially a chemoluminescent, photoluminescent, or bioluminescent dye.

11. Method according to one of the foregoing claims, characterized by the fact that the marker is a fluorescent dye, preferably a fluorochrome, and with greater preference a rhodamine, especially tetramethylrhodamine isothiocyanate (= TRITC).

12. Method according to one of the foregoing claims, characterized by the fact that the receptor has inherent fluorescence.

13. Method according to Claim 12, characterized by the fact that the amino acid tryptophan provides the inherent fluorescence.

14. Method according to one of the foregoing claims, characterized by the fact that the binding between receptor and marker has a fluorescence half-life in the range of nanoseconds (= ns).

15. Method according to one of the foregoing claims, characterized by the fact that the receptor-marker complex has fluorescence resonance energy transfer (= FRET).

16. Method according to Claim 15, characterized by the fact that the fluorescence of the FRET is modified by the interaction of the ligand with the receptor.

17. Method according to Claim 15 or 16, characterized by the fact that the receptor has the donor and the acceptor of the FRET.

18. Method according to one of Claims 15 to 17, characterized by the fact that the fluorescence is produced by the donor or the fluorescence is quenched by the acceptor.

19. Method according to one of Claims 15 to 18, characterized by the fact that the ligand acts as the donor of the FRET.

20. Method according to one of Claims 15 to 18, characterized by the fact that the ligand brings the donor and the acceptor of the FRET directly into contact.

21. Method according to one of the foregoing claims, characterized by the fact that fluorescence-labeled ligands are used.

22. Method according to one of the foregoing claims, characterized by the fact that the marker is a microparticle.

23. Biosensor, especially a protein sensor, that can be produced by a method according to Claims 1 to 22.